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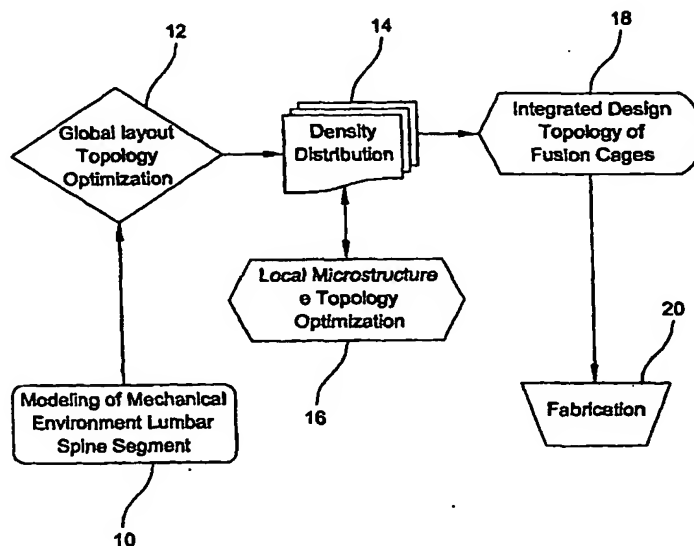
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(54) Title: **INTEGRATED GLOBAL LAYOUT AND LOCAL MICROSTRUCTURE TOPOLOGY OPTIMIZATION APPROACH FOR SPINAL CAGE DESIGN AND FABRICATION**



(57) Abstract: A method being in block (10) where a mechanical environment of a lumbar spine segments is modeled. In block (12) the method perform a global layout topology optimization process. Then in Block (14), the method performs density distribution on the global layout topology optimization solution from block (12). The density distribution contemplates a local microstructure topology optimization solution from block (16). After completion of the density distribution process in block (14), the methods proceeds to block (18). In block 18, the methods provides an integrated design topology solution for the fusion cage. In the block (20), the as-designed cage fabricated.



Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G06F 19/00

US CL : 700/118; 606/85; 623/17.11

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 700/118; 606/85; 623/17.11

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6,425,920 B1 (Hamada) 30 July 2002, (30.07.2002), Whole Document.	1-20
A	US 6,443,989 B1 (Jackson) 03 September 2002 (03.09.2002), Whole Document.	1-20
A	US 6,471,724 B2 (ZBEDLICK et al.) 29 OCTOBER 2002 (29.10.2002), Whole Document.	1-20

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

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INTERNATIONAL SEARCH REPORT

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Continuation of Item 4 of the first sheet:

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MICROSTRUCTURE TOPOLOGY OPTIMIZATION APPROACH FOR CAGE DESIGN